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ABSTRACT

This brochure contains two activities for upper elementary, middle school, and high school students that focuses on the method of "tag and recapture" used to estimate wildlife populations. The first activity involves students in tagging and recapturing animal shaped cookies and building a data table used to estimate the total number of an "animal" in the population. The second activity uses the same procedure but substitutes students within the school population for the animal crackers. Provides worksheets with data tables and instructions for calculation of population estimates. (LZ)

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Animal Population Survey: Tag and Recapture

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Grades 5-12

October 1994

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DOE/EM-0210

Animal Population Survey: Tag and Recapture

Grades 5-12

October 1994

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Animal Population Survey: Tag and Recapture

Grade Level: Upper Elementary to High School
Subjects: Science, Environmental Science, Biology, Math
Objective: To become familiar with a method used to count animals when actual counting is not possible.

Background:

Scientists often need to know about the conditions of an area. In order to accomplish this task they survey and map the land, test the water, investigate the soil and rocks, and survey and count the local populations of plants and animals. Because many animals are constantly moving around and hiding from man, it is difficult to count them. One method used to count animals is commonly called "**tag and recapture**". With tag and recapture instead of counting every animal you capture a group of animals and tag them and then release them. Later you capture another group of the same kind of animals and see how many of them were captured and tagged before. By knowing how many you caught the first and second time and how many were caught twice, you can estimate how many animals there actually are. In these activities you will use the "tag and recapture" method to make a count of the "animals" in an area.

Activity 1: Tag and Recapture in the Classroom

Materials: Any cookie, cracker, or pasta that has an animal shape (eg. goldfish crackers, or Teddy Grahams) small paper or plastic cups (2 oz.) markers plastic sandwich bags or any similar small container

Procedure:

1. Each group should have a bag with approximately 1 measuring cup (8 oz) or large plastic drink cup (8-16 oz.) of animals, a small cup, a marker, and the data table.

2. "Capture" a small cup full of animals. This will be your tagged group. Count and mark these animals. Record the captured amount on the data page as "total number tagged".

3. Return the captured group to the bag and shake the animals up.

4. Capture a small cup full of animals. This is a recapture; try to make it the same size as your original capture. Count how many animals you captured this time (tagged and untagged) and how many of them were tagged. Record this information in you data table.

5. Repeat step #4 nine more times, recording the numbers caught in the data table.

6. Find the sum (add up) of the tagged column and the sum of the captured column.

7. Find the average of the tagged and captured columns dividing the sum by the number of samples.

8. Use the proportion formula to find the total number in the population.

9. Count the number of "animals" that were actually in the bag and compare that to your estimate.

TAG and RECAPTURE DATA

Total number of tagged animals: _____

DATA TABLE

Sample #	Total # Recaptured	Recaptured # Tagged
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
SUM		
AVERAGE		

Use this proportion to find the total number of animals in the population:

$$\frac{\textit{average of total tagged}}{\textit{average of total captured}} = \frac{\textit{actual number tagged}}{\textit{estimated number of population}}$$

Calculated number of total population: _____

Find the actual number of animals in your population by counting. How does the counted number compare to your estimated amount?

Actual number: _____

Activity 2: Tag and Recapture in the School

Materials: Ink stamp & ink pad

Procedure:

1. On the day of the lab a teacher or student should go outside before school starts and "capture and tag" a group of students. Tag these students by stamping the back of their hand.

2. During the class period count the number of students in the class and how many of them are tagged.

3. You might want to send some students out to count other classrooms to increase the number of samples taken.

4. Enter your data in the data table and calculate your population (divide by the number of samples to get your average).

5. Ask your principal or attendance office for the actual population for that day to compare your results.

DATA

Total number of students captured: _____

DATA TABLE

Sample #	Total # Recaptured	Recaptured # Tagged
1		
2		
3		
4		
5		
SUM		
AVERAGE		

Use this proportion to find the total number of animals in the population:

$$\frac{\textit{average of total tagged}}{\textit{average of total captured}} = \frac{\textit{actual number tagged}}{\textit{estimated number of population}}$$

Calculated number of population: _____ Actual number of population: _____